DOCUMENT RESUME

ED 242 432 PS 014 316

AUTHOR Rochat, P.
TITLE Oral Activity by Young Infants: Development of Two Differentiated Patterns of Response.
PUB DATE Jul 83
NOTE 12p.; Paper presented at the Biennial Meeting of the International Society for the Study of Behavioural Development (7th, Munich, West Germany, July 31-August 4, 1983).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Age Differences; *Exploratory Behavior; *Infant Behavior; *Infants; Intervals; *Neonates; Novelty (Stimulus Dimension); *Perceptual Development; Time
IDENTIFIERS *Sucking Behavior; Taste Discrimination

ABSTRACT

Pressure variations applied by newborns and by infants 1 to 4 months old to rubber nipples were recorded in three different procedures under no-fluid conditions. In the first study, infants were presented for 90 seconds with novel nipples varying in shape and in shape plus material. Results suggested that a developmental trend existed for an increase in oral exploration and decrease in sucking. Further, this age trend was found to be influenced by the type of nipple. In the second study, infants were successively presented with novel rubber nipples for 10 time blocks 30 seconds long and separated by pauses 30 seconds in duration. Results showed that, according to age, repeated presentations caused different variabilities of the mean proportion of two patterns of response: sucking and exploration. Finally, in a third investigation, gustative parameters as opposed to "geometric" features of the intra-oral stimulus were manipulated. Infants were presented for 30 seconds with a dry nipple, one previously soaked in water, or one soaked in water with 15 percent sucrose. Results confirmed the general evolution of exploration and sucking patterns of response, with responses not being significantly affected by the introduced gustative variations. Results were interpreted to support the contention that there is a double function of the mouth: nutritive as well as perceptual, with the latter function gaining in importance within the first months of life. (Author/RH)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

X This document has been reproduced as received from the person or organization originating it.
Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

ED242432

ORAL ACTIVITY BY YOUNG INFANTS :

DEVELOPMENT OF TWO DIFFERENTIATED PATTERNS OF RESPONSE

P. ROCHAT *

UNIVERSITY OF GENEVA (SWITZERLAND) AND BROWN UNIVERSITY (USA)

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY
P. Rochat

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Poster presented at the Seventh Biennal Meetings of the International Society for the Study of Behavioral Development, Munich, W. Germany, July 31 - August 4, 1983.

PS 014316

* FPSE, Université de Genève, 1211 Geneva 4, Switzerland

ABSTRACT

INFANT'S ORAL ACTIVITY IS VIEWED AS HAVING POTENTIALLY MORE THAN A NUTRITIVE FUNCTION: BESIDE THE WELL DOCUMENTED BURST-PAUSE PATTERN OF SUCKING, THE PRESENT STUDY DISTINGUISHES ANOTHER RESPONSE OF A LESS STABLE TEMPORAL ORGANIZATION. THIS PATTERN IS DEFINED AS "EXPLORATION", BEING RELATED TO MOVEMENTS AND SCANNINGS OF THE TONGUE AND LIPS RELATIVE TO INTRA-ORAL STIMULUS. PRESSURE VARIATIONS APPLIED BY NEWBORNS AND ONE TO FOUR MONTHS OLDERS TO RUBBER NIPPLES WERE RECORDED IN THREE DIFFERENT PROCEDURES UNDER NO-FLUID CONDITIONS.

IN A FIRST RESEARCH, INFANTS WERE PRESENTED FOR 90 SEC. WITH NOVEL NIPPLES VARYING IN SHAPE AND IN SHAPE PLUS MATERIAL. RESULTS SUGGEST THAT A DEVELOPMENTAL TREND EXISTS, SHOWING AN INCREASE IN ORAL EXPLORATION AND DECREASE IN SUCKING. FURTHER, THIS AGE TREND IS INFLUENCED BY THE TYPE OF NIPPLE: FOR THE YOUNGER INFANTS THE ADDITION OF THE NOVEL MATERIAL APPEARS TO BE THE BASIS OF A DIFFERENTIAL RESPONSE; GLOBAL SHAPE APPEARING TO BE A RELEVANT STIMULUS CHARACTERISTIC FOR OLDER INFANTS.

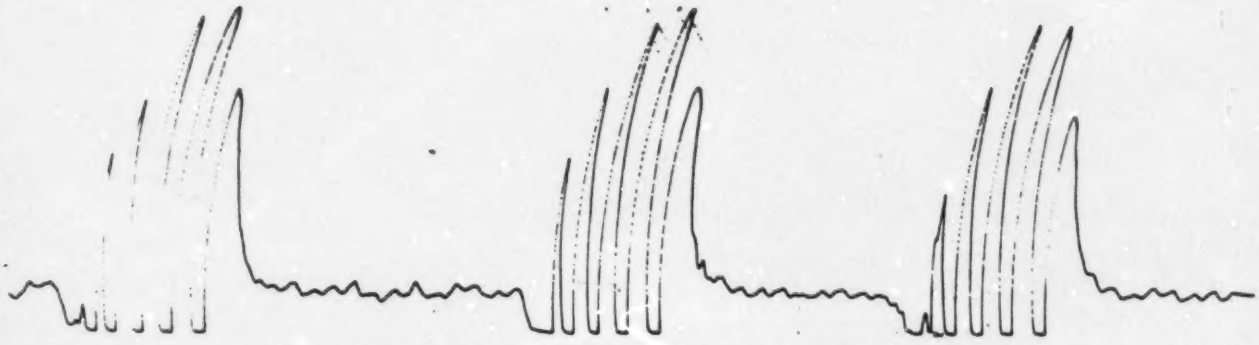
IN A SECOND RESEARCH, INFANTS WERE SUCCESSIVELY PRESENTED WITH NOVEL RUBBER NIPPLE FOR TEN BLOCKS OF 30 SEC., SEPARATED BY 30 SEC. PAUSES. IN ADDITION TO FURTHER EVIDENCE OF AN OVERALL INCREASE OF EXPLORATION AND DECREASE OF SUCKING DURING THE FIRST MONTHS OF LIFE, RESULTS SHOW THAT ACCORDING TO AGE, REPEATED PRESENTATIONS CAUSE DIFFERENT VARIABILITIES OF THE MEAN PROPORTION OF THIS TWO PATTERNS OF RESPONSE.

FINALLY, IN A THIRD INVESTIGATION, GUSTATIVE PARAMETERS AS OPPOSED TO "GEOMETRIC" FEATURES OF THE INTRA-ORAL STIMULUS WERE MANIPULATED. INFANTS WERE PRESENTED FOR 30 SEC. WITH A DRY NIPPLE OR PREVIOUSLY SOAKED INTO WATER OR SOAKED INTO WATER WITH 15 % SUCROSE. RESULTS CONFIRM THE GENERAL EVOLUTION OF EXPLORATION AND SUCKING PATTERNS OF RESPONSE, THESE RESPONSES BEING NOT SIGNIFICANTLY AFFECTED BY THE INTRODUCED GUSTATIVE VARIATIONS.

THIS BODY OF RESULTS ARE INTERPRETED AS A SUPPORT OF THE CONTENTION THAT THERE IS A DOUBLE FUNCION OF THE MOUTH: NUTRITIVE AS WELL AS PERCEPTUAL. THE APPARENT GROWING IMPORTANCE OF THE LATTER IN THE COURSE OF EARLY DEVELOPMENT IS DISCUSSED IN TERMS OF AN ELABORATION OF THE MOUTH BY THE INFANT AS A TACTUAL TOOL FOR THE DISCOVERY OF HIS/HER ENVIRONMENT AND CERTAIN OF ITS PROPERTIES.

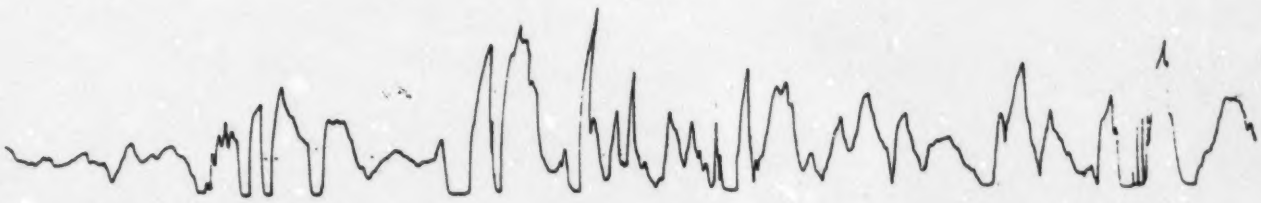
TWO PATTERNS OF ORAL RESPONSE

TYPICAL POLYGRAPHIC RECORDING OF SUCKING RESPONSES (SUCT), WITH THE NIPPLE CONNECTED TO AN AIR PRESSURE TRANSDUCER :



RYTHMIC POSITIVE PRESSURES SEPARATED BY REST PERIODS

TYPICAL POLYGRAPHIC RECORDING OF EXPLORATORY RESPONSES (EXPL), WITH THE NIPPLE CONNECTED TO AN AIR PRESSURE TRANSDUCER :

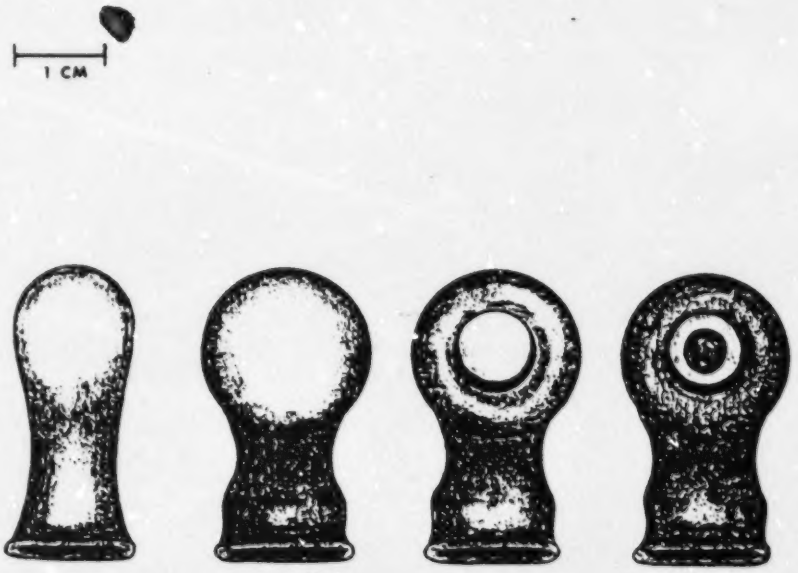


SUCCESSION OF IRREGULAR POSITIVE PRESSURES RELATED TO MOVEMENTS AND SCANNINGS OF THE TONGUE AND LIPS RELATIVE TO INTRA-ORAL STIMULUS

STUDY I

INFANTS RESPONSE TO VARIATIONS OF NIPPLE CHARACTERISTICS (*)

PROCEDURE : INFANTS WERE PRESENTED FOR 90 SEC. WITH NOVEL INTRA-ORAL STIMULI VARYING IN SHAPE AND SHAPE + MATERIAL (S1, S2, S3, S4)

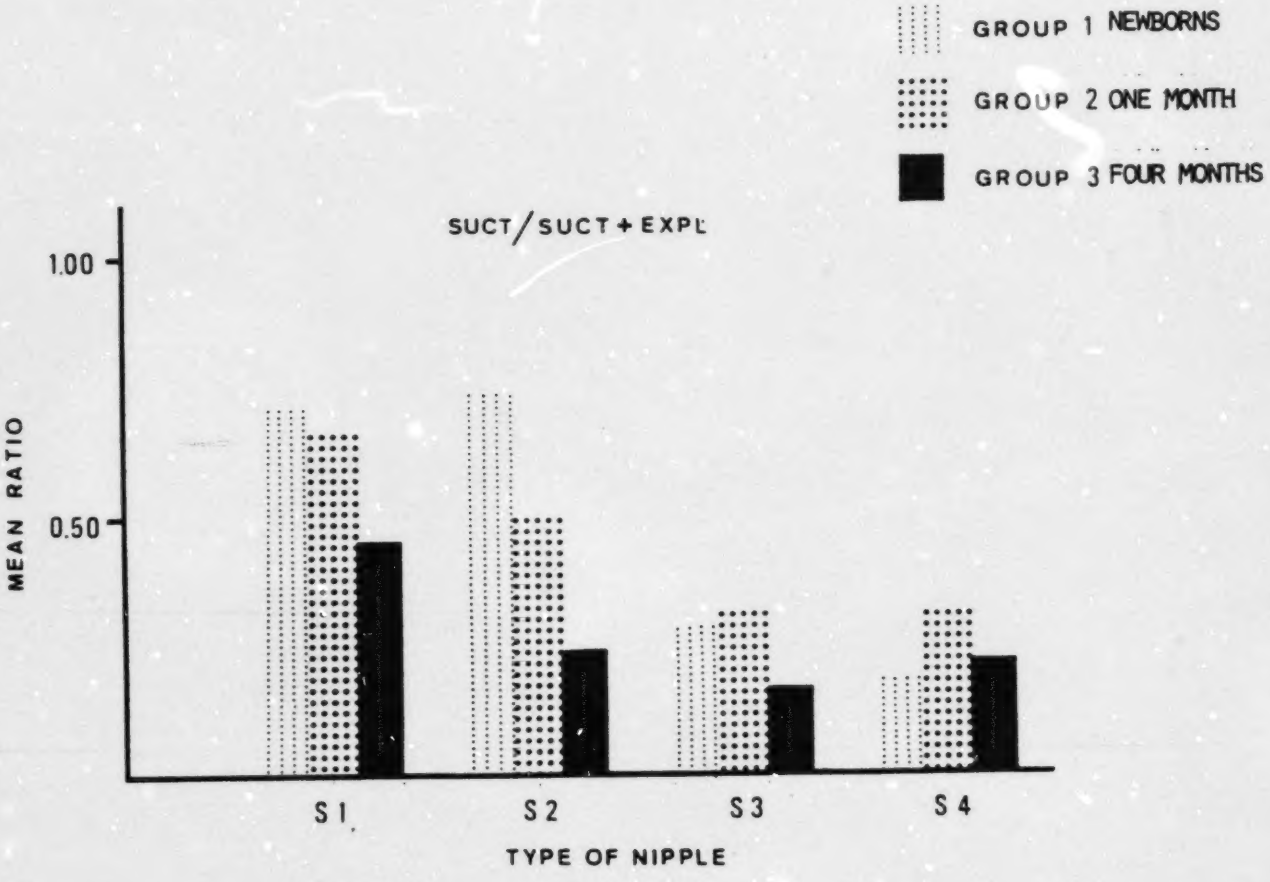


THE FOUR DIFFERENT INTRA-ORAL STIMULI USED, S1 BEING THE CONTROL STIMULUS FAMILIAR TO THE TESTED INFANTS, S2 VARYING IN SHAPE ONLY AS S3 AND S4 ARE VARYING IN SHAPE + MATERIAL

POPULATION : 10 NEONATES, 10 ONE MONTH AND 10 FOUR MONTHS OLD INFANTS (N=30)

(*) International Journal of Behavioral Development, 1983, 6, 123-133

RESULTS : FOR EACH 90 SEC. PRESENTATION OF A STIMULUS, THE MEAN DURATION OF SUCKING (SUCT) AND EXPLORATORY RESPONSE (EXPL) WAS CONSIDERED. MEAN RATIOS OF SUCT/SUCT+EXPL WAS FURTHER CALCULATED FOR EACH AGE GROUP AND EACH TYPE OF NIPPLE



- WITH AGE, THERE IS A SIGNIFICANT INCREASE IN ORAL EXPLORATION (EXPL) AND A CORRESPONDING DECREASE IN SUCKING (SUCT)

- THIS AGE TREND APPEARS TO BE SIGNIFICANTLY INFLUENCED BY THE TYPE OF NIPPLE: FOR THE NEWBORNS THE ADDITION OF THE NOVEL MATERIAL (S3, S4) CAUSES A DIFFERENTIAL RESPONSE, GLOBAL SHAPE VARIATION (S1 VERSUS S2) CAUSING A DIFFERENTIAL RESPONSE FOR OLDER INFANTS ONLY. GROUP 2 (ONE MONTH OLD INFANTS) SHOW DIFFERENTIAL RESPONSES FOR BOTH VARIATIONS (MATERIAL AND GLOBAL SHAPE), THUS APPEARING TO BE IN A TRANSITIONARY STAGE OF DEVELOPMENT

STUDY II

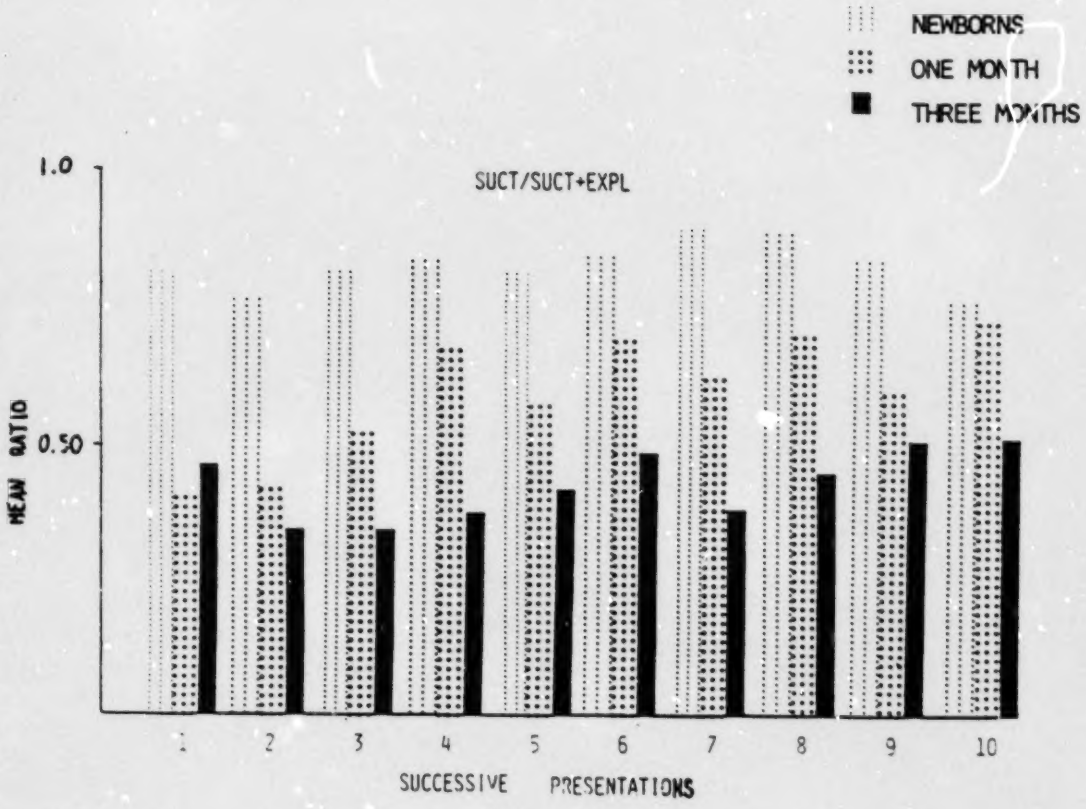
INFANTS RESPONSE TO SUCCESSIVE PRESENTATIONS WITH A NOVEL NIPPLE

PROCEDURE : INFANTS WERE SUCCESSIVELY PRESENTED WITH A NOVEL INTRA-ORAL STIMULUS FOR TEN BLOCKS OF 30 SEC., SEPARATED BY 30 SEC. PAUSES

THE NOVEL INTRA-ORAL STIMULUS USED IN THE PRESENT STUDY

POPULATION : 20 NEONATES, 10 ONE MONTH AND 10 THREE MONTHS OLD INFANTS (N=40)

RESULTS : FOR EACH BLOCK OF 30 SEC. PRESENTATION, THE MEAN DURATION OF SUCKING (SUCT) AND EXPLORATORY RESPONSE (EXPL) WAS CONSIDERED. MEAN RATIOS OF SUCT/SUCT+EXPL WAS FURTHER CALCULATED FOR EACH AGE GROUP AND EACH OF THE TEN BLOCKS OF PRESENTATION



- THERE IS A FURTHER EVIDENCE OF AN OVERALL INCREASE OF EXPLORATION AND DECREASE OF SUCKING DURING THE FIRST MONTHS OF LIFE

- ACCORDING TO AGE, REPEATED PRESENTATIONS CAUSE DIFFERENT VARIABILITIES OF THE MEAN PROPORTION OF THE TWO PATTERNS OF ORAL RESPONSE. NEWBORNS SHOW A RELATIVE STABLE RATIO OF SUCT/SUCT+EXPL THROUGHOUT THE SUCCESSIVE PRESENTATIONS, AS ITS VALUE TENDS TO INCREASE BY ONE MONTH OLD INFANTS (CORRESPONDING TO A DECREASE IN THE EXPLORATORY RESPONSE AND INCREASE IN SUCKING)

STUDY III

INFANTS RESPONSE TO GUSTATIVE VARIATIONS OF THE NIPPLE

PROCEDURE : INFANTS WERE PRESENTED FOR 30 SEC. WITH A DRY NIPPLE OR PREVIOUSLY SOAKED INTO WATER OR SOAKED INTO WATER WITH 15 % SUCROSE (DRY, H_2O, 15%)

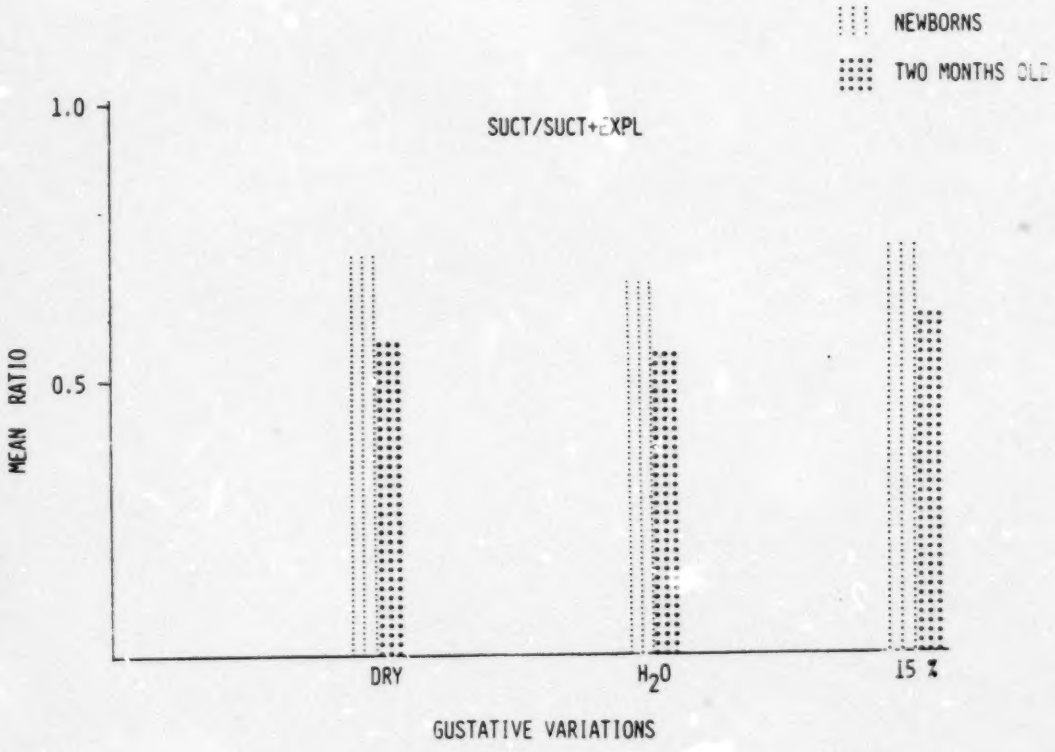
DRY

PREVIOUSLY SOAKED IN H_2O

PREVIOUSLY SOAKED IN H_2O WITH 15 % SUCROSE

POPULATION : 12 NEONATES AND 12 TWO MONTHS OLD INFANTS (N=24)

RESULTS : FOR EACH 30 SEC. PRESENTATION OF A STIMULUS, THE MEAN DURATION OF SUCKING (SUCT) AND EXPLORATORY RESPONSE (EXPL) WAS CONSIDERED. MEAN RATIOS OF SUCT/SUCT+EXPL WAS FURTHER CALCULATED FOR EACH AGE GROUP AND EACH GUSTATIVE VARIATION OF THE NIPPLE.



- AGAIN THERE IS A CONFIRMATION OF THE GENERAL EVOLUTION WITHIN THE FIRST MONTHS OF LIFE REGARDING THE TWO DIFFERENTIATED PATTERNS OF ORAL RESPONSE (INCREASE IN EXPL AND DECREASE IN SUCT)

- FOR EACH AGE GROUP, MEAN RATIO OF SUCT/SUCT+EXPL IS NOT SIGNIFICANTLY AFFECTED BY THE INTRODUCED GUSTATIVE VARIATIONS

CONCLUSIONS

- THE ORAL ACTIVITY OF THE YOUNG INFANT DOES NOT ALWAYS ENTAIL A SUCKING RESPONSE -

Besides the well documented burst-pause pattern of the sucking response, a clearly distinct oral behaviour can be observed by young infants under standard no-fluid conditions. This pattern is of a less stable temporal organization and corresponds to movements and scannings of tongue and lips relative to the intra-oral stimulus. This apparent exploratory oral behaviour might be a more specific perceptual response compared to sucking.

- WITHIN THE FIRST FOUR MONTHS OF LIFE THERE IS A SIGNIFICANT INCREASE OF ORAL EXPLORATION AND A CORRESPONDING DECREASE IN SUCKING -

Results obtained in the three different studies consistently show that a developmental trend exists. Whereas the oral activity of newborn consists mainly of a sucking response, this response is progressively less important by one and four month olders. Furthermore, this decrease does not seem to involve a diminution of the infant overall activity. From birth, the oral activity tends to be oriented increasingly towards an exploratory response.

- IN THE COURSE OF EARLY DEVELOPMENT, CHANGES OCCUR REGARDING THE INTRA-ORAL STIMULUS FEATURES THAT CAUSE DIFFERENTIAL RESPONSE, CERTAIN APPEARING NOT TO BE RELEVANT -

Results from the first study show that the addition of novel material to the nipple is the basis of a significant increase in oral exploration and a corresponding decrease in sucking only for newborns and one month old infants. By three months of age, variations in the global shape of the intra-oral stimulus become relevant characteristics causing differential response. On the other hand, from birth to two months of age, gustative variations in the nipple do not entail a significant change in sucking and exploratory responses. It thus appears that some selective intra-oral features are dependent on the age of the young infant, while others do not.

THIS BODY OF RESULTS SUPPORTS THE VIEW THAT ORAL ACTIVITY OF THE YOUNG INFANT HAS A DOUBLE FUNCTION, NAMELY NUTRITIVE AND PERCEPTUAL, THE LATTER GAINING IN IMPORTANCE WITHIN THE FIRST MONTHS OF LIFE.

THE ORAL ZONE SHOULD INDEED BE LOOKED ON AS THE INFANT'S PRIMARY LOCUS OF TRANSACTION WITH THE SURROUNDING WORLD.

BEFORE FURTHER INSTRUMENTATION OF THE HANDS, THE MOUTH IS THE PRIVILEGED TOOL OF DIRECT AND ACTIVE CONTACT WITH THE PHYSICAL OBJECT.

WITHIN THE FIRST MONTHS OF LIFE, THE YOUNG INFANT SEEMS TO ACTIVELY DEVELOP THE PERCEPTUAL POTENTIAL OF THE MOUTH AS A TACTUAL INSTRUMENT IN HIS/HER DISCOVERY OF THE OBJECT PROPERTIES.

ACKNOWLEDGMENT

* The author is indebted to the staff of the St. Vincent Home in Providence, where the older infants were tested. The newborns were tested in the laboratory of Prof. Lewis P. Lipsitt, at Women and Infants Hospital of Rhode Island, to which the author expresses his appreciation. Mrs. Bernice Reilly, R.N., was very helpful in the testing of the newborns. The author was supported during his fellowship period at Brown University by an award from the Swiss National Scientific Research Foundation. Sources of support to Prof. Lipsitt's laboratories, from which the author benefited greatly, include the Harris Foundation, the Grant Foundation, and Brown University.